



INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING AGENDA

Driving Indiana's Economic Growth

May 4, 2006

MEMORANDUM

TO: Standards Committee

FROM: Dannie L. Smith, Secretary

RE: Agenda for the May 18, 2006 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on May 18, 2006 in the N755 Bay Window Conference Room. Please enter the meeting through the double doors directly in front of the conference room. The following agenda items are listed for consideration.

New Business

Item 12-1 306.08	Mr. Wright Transition Milling	5/18/06 300-16	3
Item 12-2 Standard Drawing	Mr. Wright 402-TMPT-01	5/18/06	4
Item 12-3 Design Manual	Mr. Wright Figure 72-3B	5/18/06	6
Item 12-4 Standard Drawings	Mr. Wright AASHTO Type II, III, or IV I-Beams Indiana 54" Bulb-Tees Indiana Bulb Tees Greater Than 54" in Depth	5/18/06	8
Item 12-5 707.02 707.03 707.11 707.12	Mr. Wright Materials General Requirements Method of Measurement Basis of Payment	5/18/06 700-57 700-58 700-64 700-64	15
Item 12-6 711.02	Mr. Wright Materials	5/18/06 700-72	16
Item 12-7 711.03	Mr. Wright General Requirements	5/18/06 700-73	20

Item 12-8 711.04	Mr. Wright Certification of Fabricators	5/18/06 700-73	21
Item 12-9 711.08	Mr. Wright Mill Test Reports	5/18/06 700-74	22
Item 12-10 711.11	Mr. Wright Straightening Material	5/18/06 700-75	23
Item 12-11 711.32(c)	Mr. Wright <i>Welding of High Performance Steel</i>	5/18/06 700-80	24
Item 12-12 711.72	Mr. Wright Method of Measurement	5/18/06 700-93	27
Item 12-13 711.73	Mr. Wright Basis of Payment	5/18/06 700-93	28
Item 12-14 Design Manual	Mr. Rust Use of Blue Pavement Markers	5/18/06	29

cc: Committee Members (7)	ACPA Representative (1)
Districts (28)	Contech Representative (1)
FHWA (3)	IKO Representative (1)
ICI Representative (1)	Bridgetek Representative (1)
IMAA Representative (1)	INDOT Toll Road (3)
APAI Representative (1)	Traffic Design (3)
ACEC Representative (1)	Estimators (3)
ADS Representative (1)	Specification Writers (4)
Mirich Representative	

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 306, BEGIN LINE 176, INSERT AS FOLLOWS:

306.08 Transition Milling

Transition milling shall consist of cutting a wedge at the beginning and ending of projects, and paving exceptions. The existing pavement shall be cut to provide a *nearly* vertical face of 1.5 in. (38 mm) for the termini of each overlay lift of base, intermediate, or surface. The existing pavement shall be milled at a rate of 720:1 or as directed to achieve

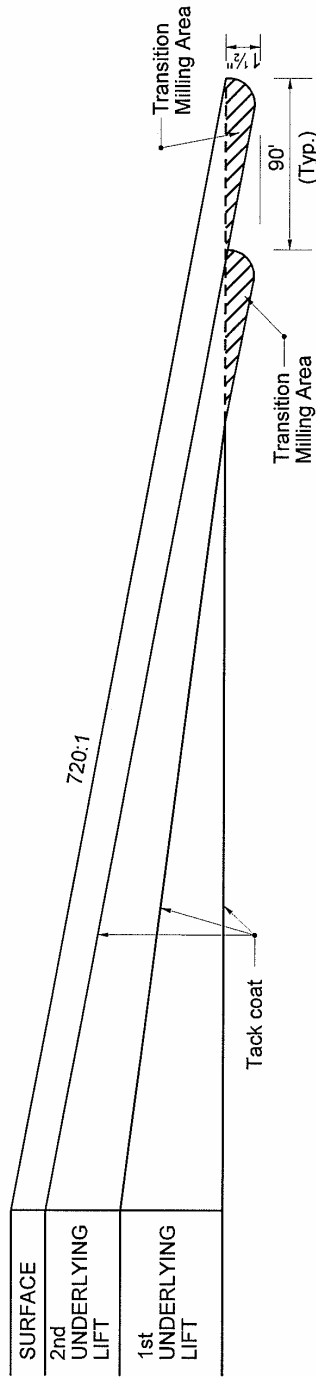
Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision Frequency Manual Update Required? Y___ N___ By - Addition or Revision
None	
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-2
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

Item No. 12-2
Mr. Wright
Date: 5/18/06

STANDARD DRAWING

402-TMPT-01, Asphalt-Pavement Wedging and Transition Milling

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Above
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____



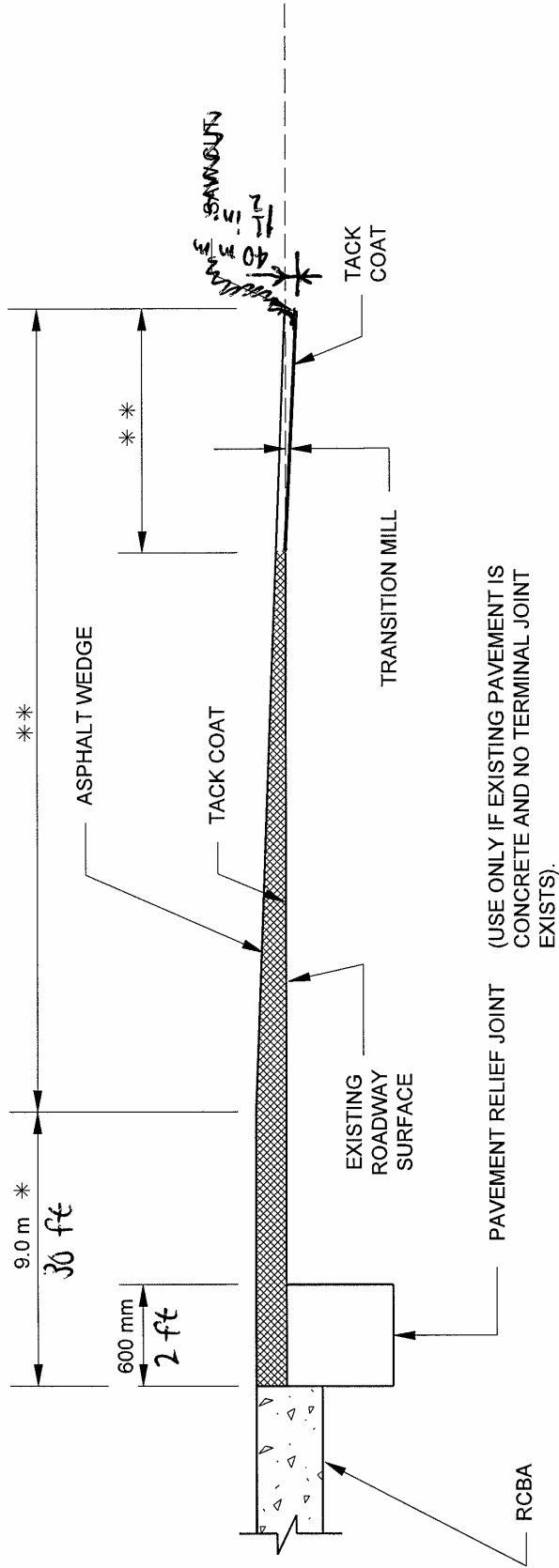
INDIANA DEPARTMENT OF TRANSPORTATION	
ASPHALT-PAVEMENT WEDGING AND TRANSITION MILLING	
MARCH 2005	
STANDARD DRAWING NO. E 402-TMPT-01	
DESIGNER NO. 3150 DATE 3/10/05	DESIGN STANDARDS ENGINEER DATE
PROFESSOR NO. 3150 DATE 3/10/05	CHIEF HIGHWAY ENGINEER DATE

Item No. 12-3
Mr. Wright
Date: 5/18/06

DESIGN MANUAL REVISION

Figure 72-3B, Pavement Transition Detail

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-2
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____



PAVEMENT TRANSITION ASPHALT WEDGE DETAIL

Figure 72-3B

Item No. 12-4
Mr. Wright
Date: 5/18/06

STANDARD DRAWINGS

707-SDPC-01, AASHTO Type II, III, or IV I-Beams
707-SDPC-02, Indiana 54" Bulb-Tees
707-SDPC-03, Indiana Bulb Tees Greater Than 54" in Depth

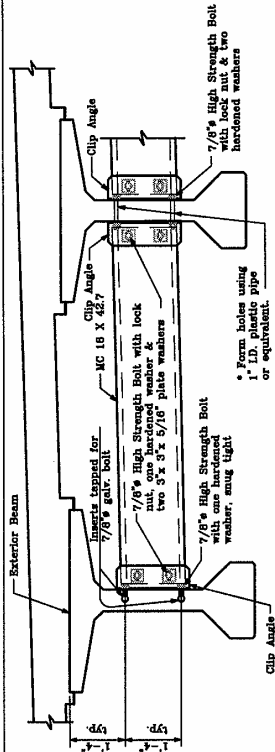
Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
707-B-085	See Above
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

[illegible]

Beam Type	Diaphragm Notes						Channel Type
	A	B	C	D	E	F	
AASHTO Type II	g	1'-0"	1'-1"	6"	3 1/2"	3"	C 12 x 20.7
AASHTO Type III	1'-1"	1'-2 1/2"	1'-5"	10"	3 1/2"	4"	MC 18 x 42.7
AASHTO Type IV	1'-1"	1'-5 1/2"	1'-8"	10"	5"	4"	MC 18 x 42.7
AASHTO Type V	1'-1"	1'-5 1/2"	1'-8"	10"	5"	4"	MC 18 x 42.7

AASHTO TYPE II I-BEAMS
AASHTO TYPE III I-BEAMS
AASHTO TYPE IV I-BEAMS

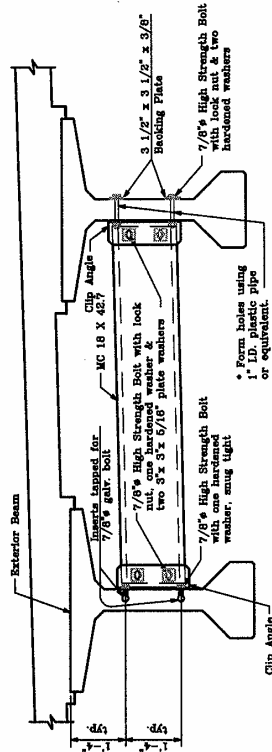
INTERMEDIATE STEEL DIAPHRAGMS



INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew~

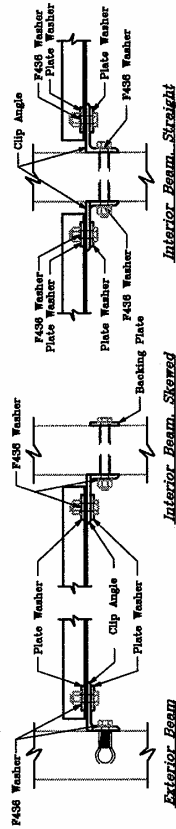
* High Strength Bolt option shown, inserts may be substituted.



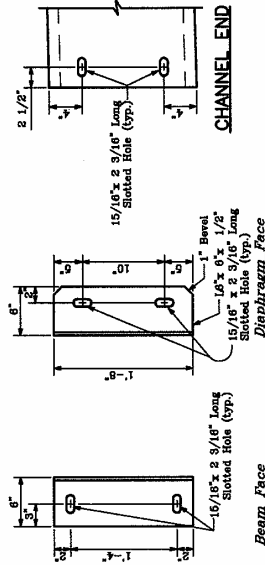
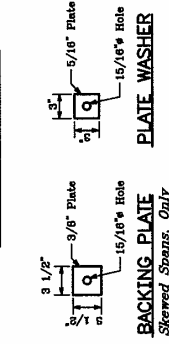
INTERMEDIATE DIAPHRAGM

~Typical for Skewed Beams~

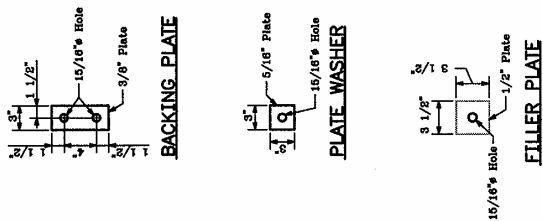
* High Strength Bolt option shown, inserts may be substituted.



CONNECTION DETAILS



INDIANA 54" BULB-TEES



Journal of Interpersonal Violence 30(1)



INDIANA DEPARTMENT OF TRANSPORTATION

Indianapolis, Indiana 46204-2249

INTER-DEPARTMENT COMMUNICATION

September 14, 2005

MEMORANDUM:

To: Robert Cales

Attention: Dan Smith

From; John Jordan *JEK*
Anne Rearick *ARR*
Tom Seeman *THS*
Niranjan Shah *NBS*
John Wright *JW*

In recent past Division of Design has received several requests to replace concrete diaphragms with steel diaphragms for prestressed concrete beam structures.

ASCE-INDOT Structural Subcommittee has considered and approved the use of the steel diaphragms. We have also attached a letter from Mr. Greg Kisinski, Design/Build Project Manager and an e-mail from Mr. Derek Merida, contractor on I-465 and 71st and 86th Street project, explaining need and benefits of such diaphragms.

Division of Design desires to create a set of standard drawings and special provisions for the use of steel interior diaphragms for concrete beam structures.

Attached is a CD containing drawings provided by Mr. Mike McCool of Beam, Longest and Neff, Consulting Engineers.

Please do not hesitate to contact Mr. Shah if you need further information.

Thank you.



INDIANA DEPARTMENT OF TRANSPORTATION

Contracts & Construction Division

Special Projects Section

100 North Senate Avenue

Room N601

Indianapolis, Indiana 46204-2216

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Joseph E. Kernan, Governor
J. BRYAN NICOL, Commissioner

Writer's Direct Line
317-234-1534

August 25, 2004

Mr. Niru Shah,

Last winter a design/build contractor requested the opinion of the structural committee on the use of steel cross frames in place of the standard concrete diaphragms that are traditionally used in the State of Indiana. The opinion was offered that the steel cross frames could be used in our case.

From a constructability point of view, the use of the galvanized steel cross frames offered a number of advantages over concrete diaphragms.

Time Savings:

Due to the fact that concrete diaphragms must be cast in place, many hours of labor are spent forming each one. This must be accomplished after the beams are set but before the decking forms or the deck reinforcement can be placed at the location of the diaphragm. This includes time for three separate operations, form, pour and strip forms. This adds days to the time it takes to construct each bridge depending on the number of diaphragms in the structure.

Steel cross frames are placed while the beams are being set adding very little if any time to the beam setting operation. This actually aids in setting the beams by helping to set the proper beam spacing. It also provides instant beam stability.

Safety:

Although I do not know of any injuries directly due the construction of concrete diaphragms, there is inherent danger in their construction due to working many hours in between the beams over the ground, traffic or water.

Much less time is spent in the position while installing steel cross frames.



When working over an open roadway, each line of concrete diaphragms requires a minimum of three lane closures. Over Interstates such as the Borman Expressway, this must be done a night due to lane closure policies. A lane must be taken (two if a center lane) for each operation, form, pour and stripping forms. Each lane closure adds expense, causes delays to traffic and adds increased potential for crashes in the backups.

Since steel diaphragms are set along with the beams, there are not additional lane closures required.

Cost Savings:

Due to the fact that these were used on a design/build contract, I can not say exactly what the direct cost savings were by using steel cross frames. However, the contractor estimated that he saved approximately \$1000 per diaphragm location. This contract had three bridges with 16 diaphragm locations per bridge. In addition, there were savings due to not having to set up multiple lane closures. There were savings due to a shorter construction time on each bridge. There was savings to the road user by eliminating some traffic delays.

Greg Kicinski, Design/Build Project Manager

	INDIANA DEPARTMENT OF TRANSPORTATION INTER-DEPARTMENT COMMUNICATION <i>Standards Section – Room N642</i>	
<i>Writer's Direct Line</i> 232-6775		

April 7, 2006 DRAFT

DESIGN MEMORANDUM No. 06-__
TECHNICAL ADVISORY

TO: All Design, Operations, and District Personnel, and
Consultants

FROM: _____
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: Structural-Steel Interior Diaphragms with Prestressed-
Concrete Members

REVISES: *Indiana Design Manual Section 63-7.02*

EFFECTIVE: _____, 2006, Letting

The contractor will be permitted to substitute structural-steel interior diaphragms for those of cast-in-place concrete in each prestressed-concrete members bridge. The substitution of steel for concrete does not affect the bridge design. Concrete diaphragms should continue to be specified, detailed, and quantified on the plans.

Recurring Special Provision 707-B-____, and Recurring Plan Detail 707-B-____d, both attached hereto, should be called for beginning with the _____, 2006, letting, and through the _____, 2007, letting. Beginning with the September __, 2007, letting, the recurring special provision will be incorporated into the INDOT *Standard Specifications*, and the recurring plan detail will be incorporated into the INDOT *Standard Drawings*. The provision and detail will then no longer be required to be called for in specific contracts.

Neither concrete nor steel interior diaphragms are pay items. Therefore, there is no affect on the Estimate of Quantities or Cost Estimate.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 707, AFTER LINE 22, INSERT AS FOLLOWS:

Structural steel for steel intermediate diaphragms shall be in accordance with 910.02(a) and shall be galvanized in accordance with ASTM A 123 after cutting, bending, and welding. Bolts for steel intermediate diaphragms shall be 7/8 in. (22 mm) and in accordance with 910.02(e)1, except they shall be type 1. All bolts, nuts, washers, and similar threaded fasteners shall be galvanized in accordance with ASTM A 123 or may be mechanically zinc coated in accordance with ASTM B 695, class 50.

SECTION 707, AFTER LINE 29, INSERT AS FOLLOWS:

The use of structural steel intermediate diaphragms will be allowed as an alternate to the concrete interior diaphragms shown on the plans. All structural steel shall be fabricated and erected in accordance with 711. Steel diaphragms shall include all connection angles, plates, and associated hardware required for a complete installation. The Contractor shall replace, re-galvanize, or repair all damaged galvanized material at the discretion of the Engineer.

SECTION 707, BEGIN LINE 333, INSERT AS FOLLOWS:

707.11 Method of Measurement

Precast or prestressed concrete structural members will be measured by the linear foot (meter) along the top of each member or by the square foot (square meter) of top surface of each member. Railing will be measured in accordance with 706.05 if specified as a pay item. *Structural steel for intermediate diaphragms will not be measured.*

SECTION 707, AFTER LINE 367, INSERT AS FOLLOWS:

The cost of all materials, including galvanizing, labor, and equipment for furnishing and installing steel intermediate diaphragms shall be included in the cost of structural member, concrete of the type and size specified.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
<u>707.03</u> 707.10 Pg 700-64	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 15, INSERT AS FOLLOWS:

Where grade HPS 70W (HPS 485W) or grade HPS 50W (HPS 345W) steel is shown on the plans, the high performance steel shall be in accordance with all provisions of ASTM A 709 (A 709M) except as modified herein. In addition to the conditions listed in Section 6.7 of ASTM A 709 (A 709M), high performance steel may be furnished as hybrid/mixed design structural components using high performance steel plates in combination with high strength, low alloy steel plates and shapes, for welded or bolted applications in bridge construction.

Quenched and tempered ASTM A 709, grade HPS 70W (ASTM A 709M, grade HPS 485W) steel plates are limited to a 50 ft (15.24 m) maximum delivery length from the mills. Alternately, ASTM A 709, grade HPS 70W (ASTM A 709M, grade HPS 485W) TMCP or other manufacturing options may be available in longer lengths, but with restrictions on thickness, depending on mill capabilities.

The impact testing requirements in accordance with 10.1 and 10.2 of ASTM A 709 (A 709M) shall meet temperature zone 2.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

~~Indiana is in temperature zone designation 2, minimum service temperature -18°C to -34°C with respect to Charpy V-notch impact requirements.~~

64-1.08 Other Design Considerations

At stress limit states, a beam should be designed for the sum of the steel and concrete slab dead loads acting on the beam alone, plus the superimposed dead load and live load acting on the composite section. Shrinkage need only be considered for a very long span or unusual configurations. At strength limit states for a compact section, large-scale inelastic activity is presumed to rearrange stress distributions in a section such that the history of stress build-up need not be considered. At a non-compact section where the factored flexural resistance is limited to the yield stress, the history of stress build-up must be considered.

An appendix to Section 6 has been provided in the *LRFD Specifications*. Appendix D provides formulas for computing the plastic moment for both positive and negative moment sections. It also explains procedures for determining the yield moment of a composite section. Appendix C provides a step-by-step approach for the design of a steel bridge superstructure. Appendix C is a convenient starting point for the design process after the entire *LRFD Specifications* have been mastered.

64-2.0 MATERIALS

Reference: Article 6.4

64-2.01 Structural Steels

64-2.01(01) Selection

The most cost-effective choice of steel grade is unpainted ASTM A 709M Grade 345W weathering steel. Its initial cost advantage compared to painted high-strength steel (e.g., A 709M Grade 345) can range up to 15%. When compared to painted ASTM A 709M Grade 250 steel, the cost advantage is approximately 20%. If future repainting costs are considered, the cost advantage is more substantial. This reflects, for example, environmental considerations in the removal of paint, which can make the use of painted steel prohibitive.

Except for long spans, the use of steel grades higher than Grade 345 may not be cost effective. In the traditional span ranges of 45 m to 60 m, optimization studies have demonstrated that the higher strength ASTM A 709M Grade HPS 485W often carries a cost premium of approximately

20% compared to Grade 345W. The use of Grade HPS 485W, when compared to Grade 345W, typically incurs the disadvantages as follows:

1. The material cost is approximately 15% higher.
2. Lighter sections with higher strength result in increased fatigue stress ranges with no offsetting increase in nominal fatigue resistance.
3. Lighter compression flanges near supports may increase the lateral bracing requirements.
4. Although seldom used for a typical design, moment redistribution and inelastic analysis procedures are not permitted with Grade HPS 485W.

Approval to use Grade HPS 485W steel will be made by the Design Division Chief for each INDOT-route structure. The economic analysis prepared at the structure type and size stage will serve as the basis for this decision. For a local public agency structure, the designer must obtain the written approval of an elected official of the agency.

Despite its cost advantage, the use of weathering steel is not appropriate in all environments and at all locations. The application of weathering steel and its potential problems are discussed in depth in FHWA *Technical Advisory: Uncoated Weathering Steel in Structures*, October 3, 1989. Also the proceedings of the Weathering Steel Forum, July 1989, are available from the FHWA Office of Implementation, HRT-10. Weathering steel should not be used where any of the following adverse conditions exist.

1. Environment. Weathering steel should not be used in an industrial area where concentrated chemical fumes may drift onto the structure. If in doubt, its suitability should be determined by a corrosion consultant.
2. Location. Weathering steel should not be used at a grade separation in a "tunnel" condition, which is produced by a depressed roadway section with narrow shoulders between vertical retaining walls, with a shallow vertical clearance, and with deep abutments adjacent to the shoulders. This "tunnel" effect prevents roadway spray from being dissipated and spread by air currents. Note that there is no evidence of salt spray corrosion where the longitudinal extent of the vertical walls is limited to the abutment itself, and roadway spray can be dissipated on both approaches.
3. Low-Level Water Crossing. Sufficient clearance over a body of water should be maintained so that water vapor condensation does not result in prolonged periods of wetness on the steel. For weathering steel, clearance to the bottom flange should be at least 3.0 m over sheltered, stagnant water and at least 2.5 m above average low water levels for running streams.

Where unpainted weathering steel is inappropriate, and a concrete-members alternative is not feasible, the most economical painted steel is ASTM A 709M Grade 345 steel in both webs and flanges.

The FHWA *Technical Advisory: Uncoated Weathering Steel in Structures* is an excellent source of information, but its recommendation for partial painting of the steel in the vicinity of deck joints should not be considered the first choice. The best solution is to eliminate deck joints. In a shorter bridge, the end joint is replaced by an integral end bent (see Chapter Sixty-seven).

64-2.01(02) Hybrid Girders

Grade HPS 485W flanges and Grade 345W webs or Grade 345 flanges and Grade 250 webs are permitted.

~~64-2.01(03) Details for Unpainted Weathering Steel~~

The following drainage treatments should be considered to avoid premature deterioration.

1. A drip bead should be provided at the end of each deck overhang.
2. The number of bridge deck drains should be minimized, the drainage pipes should be generous in size, and they should extend below the steel soffit as specified in Chapter Thirty-three.
3. Eliminate details that serve as water and debris traps. Seal or paint overlapping surfaces exposed to water. This applies to non-slip-critical bolted joints. Slip-critical bolted joints or splices should not produce rust-pack where the bolts are spaced according to the *LRFD Specifications* and, therefore, do not require special protection.
4. Consider protecting pier caps and abutment walls to minimize staining.
5. Consider wrapping the piers and abutments during construction to minimize staining while the steel is exposed to rainfall.
6. If an expansion joint is used, paint the superstructure steel within 3 m of the joint.

64-2.02 Bolts

~~Reference: Article 6.4.3~~

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 48, INSERT AS FOLLOWS:

Fabrication of high performance steel shall be in accordance with the AASHTO Guide Specifications for Highway Bridge Fabrication with HPS 70W Steel, an addendum to ANSI/AASHTO/AWS D1.5M/D1.5:2002, except as modified herein.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
724.03(a) Pg 700-151	Frequency Manual
724.03(c) Pg 700-151	Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 48, INSERT AS FOLLOWS:

Only fabricators meeting the requirements of the AISC Quality Certification Program, "Major Steel Bridges (Cbr)" with "Fracture Critical Members Endorsement (F)", or approved equal, may be used to fabricate using high performance steel. Prior to approval for fabrication, the results of the latest AISC certification review shall be made available to the Engineer to determine if items critical to successful fabrication meet the needs of the specific work.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, BEGIN LINE 91,DELETE AND INSERT AS FOLLOWS:

711.08 Mill Test Reports

Prior to, or concurrent with, the fabrication, ~~four copies~~ *a copy of the* mill test reports shall be furnished. If the manufacturer's mill test reports are not available, tests shall be made

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
910.02(c) Pg 900-72	Frequency Manual
910.02(d) Pg 900-73	Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 138, INSERT AS FOLLOWS:

Short term application of heat to high performance steel for purposes of heat curving, heat straightening, camber and sweep adjustment, or other reasons is limited and not to exceed 1100°F (590°C). All applications of heating shall be done by procedures approved by the Department.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
711.59 Pg 700-87	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, AFTER LINE 399, INSERT AS FOLLOWS:

(c) Welding of High Performance Steel

All welding on high performance steel shall be in accordance with the ANSI/AASHTO/AWS D1.5M/D1.5 Bridge Welding Code, hereinafter referred to as the Bridge Welding Code, except as modified herein and by the AASHTO Guide Specifications for Highway Bridge Fabrication with HPS 70W Steel, an addendum to the 2002 Edition of the Bridge Welding Code.

Only submerged arc welding, SAW, and shielded metal arc welding, SMAW, processes will be permitted. Consumable handling requirements shall be in accordance with the Bridge Welding Code, Section 12.6.5 and 12.6.6, when using reduced preheat as described in Table 3 of the Guide, except that SAW consumables for matching weld metal shall meet the hydrogen control level of H4 in accordance with Section 12, Article 12.6.2. Consumable handling requirements shall meet the provisions of The Bridge Welding Code, Section 4, when using the preheat requirements of Table 4.4, except that the diffusible hydrogen level must never exceed H8. SMAW consumables may meet diffusible hydrogen levels of either H4 or H8 except the higher preheat and interpass temperatures as noted in Table 3 of the AASHTO Guide Specifications for Highway Bridge Fabrication with HPS 70W Steel shall apply to H8 conditions.

Filler metals used to make single pass fillet welds for web to flange applications which join HPS 70W steel plates, HPS 70W to grade 50W plates and for attaching stiffeners and connection plates to grade HPS 70W (HPS 485W) webs and flanges, shall be in accordance with the Bridge Welding Code, Table 4.1 for ASTM A 709, grade 50W (ASTM A 709M, grade 345W) base metal. Filler metals for single pass 5/16" fillet welds need not meet the requirements for exposed bare applications.

Filler metals used for all complete penetration groove welds joining grade HPS 70W (grade HPS 485W) plate to ASTM A 709, grade HPS 50W (A 709M, grade HPS 345W) or grade 50W (grade 345W) plate shall conform to the requirements for welding Grade 50W base metal.

Filler metals used for all complete penetration groove welds joining grade HPS 70W (grade HPS 485W) plates to grade HPS 70W (grade HPS 485W) plates shall conform to the requirements for HPS 70W (HPS 485W) base metal as follows:

1. *Submerged Arc Welding process:*

Wire - LA85 by Lincoln Electric Company

Flux - MIL800HPNi by Lincoln Electric Company

2. *Shielded Metal Arc Welding process*

*Matching - E9018MR**

*Undermatching - E7018MR**

* The designator 'MR', for moisture resistant coating, is required for all SMAW electrodes used for welding HPS 70W [HPS 485W] steels.

The Contractor may request approval of alternate consumables for matching strength welds in lieu of the above filler metals for SAW. The request for approval shall include documentation of successful welding and shall also include diffusible hydrogen tests, both in accordance with the Bridge Welding Code.

All welding procedures shall be qualified in accordance with the Bridge Welding Code Section 5, Qualification. In general, the provisions of Article 5.12 shall apply. Qualification tests shall measure strength, toughness and ductility, with results evaluated in accordance with Article 5.19. If specified on the plans, additional tests shall measure the Charpy V-notch toughness of the coarse grained area of the heat affected zone, HAZ. The notch in the specimens shall be carefully located in the coarse grained area of the HAZ, as determined by macro-etching the specimens prior to machining and testing. The toughness requirement for the HAZ shall be the same as the weld metal.

All procedure qualification tests shall be ultrasonically tested in accordance with the requirements of the Bridge Welding Code, Section 6, Part C. Evaluation shall be in accordance with Table 6.3, UT Acceptance – Rejection Criteria – Tensile Stress. Indications found at the interface of the backing bar may be disregarded regardless of the defect rating.

A representative of the Department must witness all welding procedure specification qualification tests.

Results of the welding procedure specification qualification tests and final welding procedure specifications shall be submitted to the Engineer for review and approval.

In general, post weld heat treatment will not be required. The use of such post weld heat treatment will require additional qualification testing.

Wherever magnetic particle testing is done, only the yoke technique will be allowed, as described in Section 6.7.6.2 of the Bridge Welding Code, modified to test using alternating current only.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, CONTINUED.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, BEGIN LINE 978,DELETE AND INSERT AS FOLLOWS:

711.72 Method of Measurement

~~Plain~~ *High performance steel, plain* structural steel shapes, fabricated steel, steel castings, iron castings, bolts, pins, rollers, rockers, anchor bolts, and threaded rods will be measured by the pound (kilogram). If the Schedule of Pay Items includes a lump sum item for structural steel, all

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 711, BEGIN LINE 1000, INSERT AS FOLLOWS:

711.73 Basis of Payment

The accepted quantities of *high performance steel*, plain structural steel shapes, fabricated steel, steel castings, iron castings, bolts, pins, rollers, rockers, anchor bolts, and threaded rods will be paid for at a contract lump sum price if the Schedule of Pay Items includes a lump sum pay item for structural steel. Changes from the estimated quantities shall be in accordance

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision Frequency Manual Update Required? Y___ N___ By - Addition or Revision
None	
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
None	See Item 12-4
Motion: Mr.	Action: Passed as submitted; revised
Second: Mr.	Effective - _____ Letting
Ayes:	_____ Supplementals
Nays:	Withdrawn _____
	Received FHWA Approval? _____

DESIGN POLICY

Policy for Use of Blue Reflective Lenses for Raised Pavement Markers

At the March 16, 2006 Standards Committee meeting, the material specifications for blue prismatic reflectors was approved for inclusion into the Specifications Book. This item will establish the guidelines for their use.

Other sections containing specific cross references: None	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected: None	Standard Sheets potentially affected: None
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn _____ Received FHWA Approval? _____



April 18, 2006

**DESIGN MEMORANDUM No. 06-XX
POLICY CHANGE**

TO: All Design, Operations, and District Personnel, and Consultants

FROM: Richard L. VanCleave
Design Policy Engineer
Office of Roadway Engineering Services

SUBJECT: Use of Blue Reflectors for Snowplowable Raised Pavement
Markers to Denote the Locations of Fire Hydrants along Roadways
or Streets.

EFFECTIVE:

A new policy relating to the use of blue reflectors for snowplowable raised pavement markers to denote the location of fire hydrants within the right of way along roadways or streets has been developed.

Technical advisory 06-XX relating to the use of blue reflectors for snowplowable raised pavement markers indicating the location of fire hydrants along roadways or streets has been developed also. This Technical Advisory will remain in effect until superseded by an official Design Manual revision or another Design Memorandum/Policy Change document. Designers are instructed to follow the Technical Advisory guidelines for locating and placing the blue snowplowable pavement markers.



April 18, 2006

**DESIGN MEMORANDUM No. 06-XX
TECHNICAL ADVISORY**

TO: All Design, Operations, and District Personnel, and
Consultants

FROM: Richard L. VanCleave
Design Policy Engineer
Office of Roadway Engineering Services

SUBJECT: Use of Blue Reflectors for Snowplowable Raised Pavement
Markers to Denote the Locations of Fire Hydrants along
Roadways or Streets.

EFFECTIVE:

The following design guidelines are developed for use of blue reflectors for snowplowable raised pavement markers for roadways or streets.

1. The blue reflectors should be used where fire hydrants are located within the roadway or street right-of-way.
2. The blue reflectors should be placed at approximately right angles to fire hydrant locations.
3. All snowplowable raised pavement markers with blue reflectors should be two-way markers visible in both directions of travel.
4. Blue reflectors should be placed in addition to the normal raised pavement markers.
5. For multiple lane roadways or streets the blue reflectors should be placed in the lane line marking nearest the fire hydrant but should not be placed on the pavement edge line.
6. The blue reflectors should be placed in the centerline marking where lane lines are not present.

Designers are instructed to follow this interim procedure. The Technical Advisory will remain in effect until superseded by an official Design Manual revision or another Design Procedure, Memorandum/Technical Advisory document or the policy changes.